

ABSTRACT OF THE DISCLOSURE

A differential data transmitter includes a first pre-driver configured to receive a differential data signal, a delay circuit configured to receive the differential data signal in parallel with the first pre-driver, and output the differential data signal with a delay time, and a second pre-driver configured to receive an output signal from the delay circuit. The delay circuit is capable of changing the delay time in accordance with a control signal. An output driver is configured to receive first and second output signals from the first and second pre-drivers, and output a pre-emphasis waveform signal that corresponds to a subtraction signal between the first and second output signals.